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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,747	08/01/2003	Douglas H. Rose	10031.000400	3850
31894 7590 09/20/2007 OKAMOTO & BENEDICTO, LLP P.O. BOX 641330 SAN JOSE, CA 95164			EXAMINER AHMED, SHAMIM	
			ART UNIT 1765	PAPER NUMBER
			MAIL DATE 09/20/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/632,747	ROSE ET AL.	
	Examiner	Art Unit	
	Shamim Ahmed	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6,8-23 and 28-32 is/are pending in the application.
- 4a) Of the above claim(s) 19-23 and 28-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4 and 6,8-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/6/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1,3-18 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
4. Claims 1,3,8,11,13,15-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sinton (5,053,083) in view of Yamada et al (5,650,019) and further in view of Brasch (4,378,270).

Sinton discloses a process of fabricating solar cells including the step of forming a metallization layer (58) on the back surface of the solar cells and selectively etching

the metallization layer to form back side electrodes (28,30), which electrodes are connected to an external circuit (col.7, lines 24-64).

Sinton does not explicitly teach that the electrode layer comprises copper on a top most metallic layer comprises tin.

However, Yamada et al illustrate a solar cell module having electrode layer comprises copper (205) on a conductive substrate (204) comprises tin (col.7, lines 22-67 and col.8, lines 1-3).

Therefore, it would have been obvious to one of ordinary skilled in the art to employ Yamada et al's teaching into Sinton's process as well known in the art with a success of expectation such as forming electrical contact with the doped silicon substrate as also disclosed in the applicant's disclosure in the background art.

Modified Sinton remains silent the claimed etchant selectively etching the first metallic layer (copper) without substantially etching the topmost metallic layer comprising tin.

However, in a method of manufacturing electronic circuitry, Brasch teach a process of etching copper with a composition of hydrogen peroxide, sulfuric acid and phosphoric acid using tin or tin alloy (solder) resist (col.2, lines 38-42), wherein the composition has very minor effect (col.5, lines 9-15).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Brasch's teaching into modified Sinton's process for efficiently etching the copper layer without substantially etching the topmost metallic layer as suggested by Brasch.

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5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sinton (5,053,083) in view of Yamada et al (5,650,019) and in view of Brasch (4,378,270) and further in view of Wang (6,316,831).

Modified Sinton discusses above in the paragraph 4 but fail to teach etching a second layer titanium-tungsten using an etchant comprising hydrogen peroxide.

However, Wang teach a process of manufacturing electronic device including solar cell (col.4, lines 26-38) including the step of forming titanium-tungsten layer during the manufacturing process and preferable etched the layer to form patterns using hydrogen peroxide containing etchant (col.9, lines 55-61).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Wang's teaching into modified Sinton's process for efficiently forming the solar cell device as conventional processing taught by Wang.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sinton (5,053,083) in view of Yamada et al (5,650,019) and in view of Brasch (4,378,270) and in view of Wang and further in view of Wada et al (6,787,692).

Modified Sinton discusses above in the paragraph 5 and also teach that the aluminum layer is etched with NaOH (col.3, lines 48-49).

Modified Sinton fails to teach that the etchant is potassium hydroxide (KOH).

However, Wada et al teach a process of manufacturing solar cell including the step of forming rear electrode (11b) comprising aluminum layer (col.6, lines 60-65) and disclosing conventional etching the metallic layer with alkaline or acid solution

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particularly etching the aluminum containing layer with KOH or NaOH with a range of 1 to 10 weight percent (col.7, lines 17-36).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Wada et al's conventional teaching into modified Sinton's process for effectively etching the metal layer because both the NaOH and KOH are functionally equivalent as taught by Wada et al.

7. Claim 4,6,12,14,17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sinton (5,053,083) in view of Yamada et al (5,650,019) in view of Brasch (4,378,270) as applied above, and further in view of Wada et al (6,787,692).

Modified Sinton discusses above in the paragraph 4 but fail to teach etching the copper layer with claimed specific concentration.

However, Wada et al teach a process of manufacturing solar cell including the step of forming rear electrode (11b) comprising aluminum layer (col.6, lines 60-65) and disclosing conventional etching the metallic layer with alkaline or acid solution particularly etching the aluminum containing layer with KOH or NaOH with a range of 1 to 10 weight percent (col.7, lines 17-36).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Wada et al's conventional teaching into modified Sinton's process for effectively etching the metal layer, which will result less expensive process as conventionally known in the art as taught by Wada et al.

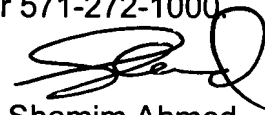
Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Shamim Ahmed
Primary Examiner
Art Unit 1765

SA
September 14, 2007